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(54) **A CORNER ELEMENT FOR A CAGE-LIKE STRUCTURE AND A CAGE-LIKE STRUCTURE PROVIDED WITH SUCH CORNER ELEMENTS**

ECKELEMENT FÜR EINE KÄFIGARTIGE STRUKTUR UND MIT SOLCHEN ECKELEMENTEN VERSEHENE KÄFIGARTIGE STRUKTUR

ÉLÉMENT D'ANGLE POUR UNE STRUCTURE DE TYPE CAGE ET STRUCTURE DE TYPE CAGE POURVUE DE TELS ÉLÉMENTS D'ANGLE

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to an element according to the preamble of claim 1.

[0002] Such elements are primarily used to build cage-like structures, such as containers, for transport of larger heavy items, such as larger electric machines, transformers, fuel tanks and the like. The volumes thereof are then several m³ and may even exceed 30 m³. The bottom plane of the structure is then mostly formed by one or several pallets, so that the lower such elements of the structure are then secured to such a pallet. A said cage-like structure typically has board-like members in the form of wooden planks, but may also have one or more such members in the form of for instance plywood boards or board-like members made of plastic.

BACKGROUND ART

[0003] An element of this type is already known through FR 2 956 384 B1. The element disclosed in that publication requires considerable work to be carried out for adapting other parts of the structure thereto. It may only be used with said board-like members of one exact thickness, as one example, and as for instance single pieces in a set of wooden planks may have a thickness slightly differing from each other the entire cage-like structure may be unstable.

[0004] Other elements of this type are known through the documents US 2014021090 A1 and CN 206520843 U.

SUMMARY OF THE INVENTION

[0005] The object of the present invention is to provide an element of the type defined in the introduction being improved in at least some aspect with respect to such elements already known, through for instance said documents.

[0006] This object is according to the invention obtained by providing such an element, which is characterized in that the inner wall portions each comprises a spring member configured to, in a rest state, extend into said space at least partly towards the opposite outer wall portion and to be urged away from this outer wall portion by said first and second board-like members when received between said couple of wall portions while storing potential energy and bear onto and urge said second board-like member to press said first board-like member against said outer wall portion, and that each spring member has locking means comprising a retaining part protruding from a main body of the spring member in a direction down towards the bottom portion of the element, which retaining part is configured to, in the active state of the element, bear onto and urge a said second board-like member in a direction at least partly down towards

the bottom portion so as to counteract movement of this board-like member away from the bottom portion and out of said space.

[0007] Such a design of the element enabling two said first board-like members and two said second board-like members to be firmly held therein by being clamped between each couple of inner and outer wall portions which makes it possible to obtain a very stable cage-like structure allowing secure transport of large heavy items. Another advantage of this design of a said element is that it may be used together with said board-like members of many different thicknesses, as the distance between a couple of inner and outer wall portions is in each case adjusted by the spring members to suit the specific board-like members used. Hence, the board-like members have not to be prepared by any type of machining for being used to build the structure except for being cut to the desired lengths, which means that board-like members of various dimensions may be used. This facilitates the work to build a said cage-like structure at a low cost.

[0008] Furthermore, this design of each spring member and more specifically of the retaining parts thereof gives each spring member extra grip in a surface of a wide side of a said second board-like member so that this board-like member is held in place even without screws.

[0009] According to an embodiment of the invention each spring member has locking means configured to, in the active state of the element, interact with locking means on a said second board-like member received in said space so as to fixedly secure said board-like member to the spring member. This design of each spring member facilitates securing of a respective second board-like member in the space of the element without use of separate fastening means, such as screws.

[0010] According to another embodiment of the invention the locking means of each spring member comprises a retaining part protruding from a main body of the spring member and configured to interact with locking means of a said second board-like member in the form of a recess on a said wide side of this member by being received in and engage with the recess in a locking position of the retaining part so as to fixedly secure said board-like member to the spring member. The advantage of this embodiment is the same as that of the embodiment just mentioned.

[0011] According to another embodiment of the invention each retaining part has a guide surface facing away from and pointing down towards the bottom portion of the element, the guide surface is configured to receive a bottom side of a said second board-like member upon insertion thereof in said space in a direction perpendicular to the bottom portion and to guide this member along the guide surface towards and past a lower edge thereof, whereafter the second board-like member is allowed to be brought straight down towards the bottom portion with the lower edge of the guide surface pressing against a wide side of the second board-like member, and the re-

taining part is configured to snap out to the locking position once a first edge of the recess on the second board-like member has been brought past the lower edge of the guide surface. This design of each spring member facilitates quick and easy insertion and securing of the second board-like members in the element and thereby a quick assembly of the cage-like structure.

[0012] According to another embodiment of the invention the locking means of each spring member comprises a said retaining part in the form of a flap configured to interact with a said recess in the form of an elongated groove arranged at a surface of a said wide side of a said second board-like member and extending perpendicularly to the longitudinal extension thereof.

[0013] According to another embodiment of the invention each outer wall portion is provided with an aperture configured to receive a strap to be led to and through a corresponding aperture in a said element arranged at the opposite said plane of the structure and to be tightened for increasing the stability of said structure.

[0014] According to another embodiment of the invention the aperture is then located where the outer wall portion is joined to the bottom portion and extends into the bottom portion. This enables comfortable use of straps to further stabilize large structures carrying extremely heavy items when needed.

[0015] According to another embodiment of the invention the bottom portion is provided with through-holes enabling securing of this portion by screws to another member of the structure or a member outside the structure. The stability of a cage-like structure built by using elements according to the invention may by this be further increased by securing the elements in this way.

[0016] According to another embodiment of the invention each outer wall portion is provided with at least one through-hole enabling securing of a said first board-like member thereto by a screw. The advantage of this embodiment is the same as that of the embodiment just mentioned.

[0017] According to another embodiment of the invention each said opening comprises a stop member extending from the bottom portion in parallel with a respective said wall member to form a stop for an end of a said first board-like member introduced through said opening, and the two outer wall portions are connected to each other through the two stop members so that in a said active state of the element an outer recess with a square cross-section as seen perpendicularly to the bottom portion is formed externally of the element along said edge of the structure. This means that the two first board-like members received in the same element will not bear onto each other but onto said stop member, which increases the stability of a corner of a said cage-like structure obtained by use of the element.

[0018] According to another embodiment of the invention constituting a further development of the embodiment last mentioned each said stop member has a width in the direction pointing towards the opening associated

with the other stop member being identical or substantially identical to the width of said thin side of a said first board-like member to be received in the element.

[0019] According to another embodiment of the invention the bottom portion is where each outer wall portion is joined thereto provided with a slot enabling folding of a part of the bottom portion out from the rest of the bottom portion to extend perpendicularly thereto in a direction opposite to the extension of the outer wall portions from the bottom portion. Said part of the bottom portion may when folded out for instance be used as a guide for stacking an item onto the cage-like structure when the element is used at an upper corner of the structure, and when this part of the bottom portion is provided with at least one through-hole enabling securing of this part to a member outside the structure, as in another embodiment of the invention, this part may be used for then securing a lid covering the rest of the structure.

[0020] According to another embodiment of the invention all parts of the element are plate-like, and it is then preferred that they are made of one single flat material piece bent to form the element, and this is preferably of metal making the element strong and also easy to produce at a low cost, such as by bending and punching.

[0021] The invention also relates to a cage-like structure, such as a container, which is provided with an element according to any of the preceding claims at each of eight said corners thereof.

[0022] Further advantages as well as advantageous features of the invention appear from the following description of an example of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] With reference to the appended drawings, below follows a specific description of an element and a cage-like structure according to examples of the invention.

[0024] In the drawings:

Fig. 1 is a perspective view from above of a front side of an element according to an example of the invention,

Fig. 2 is a perspective side view from above of the element shown in Fig. 1,

Fig. 3 is a perspective view from below of a back side of the element shown in Fig. 1,

Fig. 4 is a perspective view from above of a cage-like structure according to an example of the invention produced by using the element shown in Figs. 1-3 in the eight corners of the structure, and

Fig. 5 is an enlarged partly sectional view showing one of the lower corners of the cage-like struc-

ture of Fig. 4 from the inside of the structure.

DETAILED DESCRIPTION OF AN EXAMPLE OF THE INVENTION

[0025] An element 1 according to an example of the invention will now be described while making reference to Figs. 1-3 and 5. Figs. 1 and 2 show the element as it will be arranged on for instance a pallet to form a lower corner of a parallelepipedic cage-like structure, as it is in Fig. 5, whereas Fig. 3 shows the element as it will be arranged to form an upper corner of a said structure. The element 1 is made of one single flat material piece of metal bent to form the element as shown in the figures. The element comprises a bottom portion 2 with a flat surface 3 configured to bear on a thin side 4 of two first board-like members 5, such as wooden planks, of the structure meeting each other at the corner and each extending from the corner along a bottom or a top plane to an adjacent corner of the structure as shown in Fig. 4.

[0026] The element 1 has two outer wall portions 6, 7 to be located externally of the structure in the active state of the element, shown in Figs. 4 and 5, and extending from the bottom portion 2 perpendicularly thereto so as to each form a lateral support to a wide side 8 of a respective said first board-like member 5 received in the element.

[0027] Furthermore, the element 1 has two inner wall portions 9, 10 located opposite to the outer wall portions 6, 7 and in an active state of the element extending from the bottom portion 2 mainly in the same direction as the outer wall portions, i.e. each inner wall portion 9, 10 has a general extension which is parallel to the extension of the opposite outer wall portion 6, 7. There is a distance separating each couple of outer 6, 7 and inner 9, 10 wall portions so as to allow a said first board-like member 5 and a second board-like member 11 to be received therebetween, with wide sides 8, 12 of these board-like members bearing on each other. Each such second board-like member 11 is a part of the structure extending along an edge 13 between two adjacent walls 14, 15 of the structure between the bottom plane and the top plane thereof.

[0028] The inner wall portions 9, 10 each comprises a spring member 90, 100 configured to, in a rest state (as seen in Figs. 1 and 2), extend into a space 20 of the element at least partly towards the opposite outer wall portion 6, 7 and to be urged away from this outer wall portion by said first and second board-like members 5, 11 when received between a said couple of wall portions, as seen in Fig. 5, while storing potential energy and bear onto and urge said second board-like member 11 to press said first board-like member 5 against said outer wall portion 6, 7. The first and second board-like members received between a couple of inner 9, 10 and outer 6, 7 wall portions in the active state of the element 1 are thus clamped between these wall portions by the resilient action of the respective spring member 90, 100.

[0029] Each spring member 90, 100 has locking means comprising a retaining part 91, 101 in the form of a flap protruding from a main body 92, 102 of the spring member in a direction down towards the bottom portion 2 of the element 1. Each retaining part is configured to, in the active state of the element, bear onto and by the resilient action of the respective spring member urge a said second board-like member 11 in a direction at least partly down towards the bottom portion 2 so as to counteract movement of this board-like member 11 away from the bottom portion and out of said space 20. This design of each spring member 90, 100 and more specifically of the retaining parts 91, 101 thereof gives each spring member extra grip in a surface of a wide side 12 of a said second board-like member so that this board-like member is held in place even without screws.

[0030] To facilitate a more secure locking of the second board-like members 11 in the space 20 of the element 1, each retaining part 91, 101 is further configured to interact with locking means of a said second board-like member in the form of a recess 46, namely an elongated groove arranged at the surface of said wide side 12 of the second board-like member 11 and extending perpendicularly to the longitudinal extension thereof. More specifically, each retaining part 91, 101 is configured to be received in and engage with a said recess 46 in a locking position of the retaining part so as to fixedly secure the respective second board-like member 11 to the spring member 90, 100.

[0031] Furthermore, each retaining part 91, 101 has a guide surface 93, 103 facing away from and pointing down towards the bottom portion 2 of the element 1. The guide surface is configured to receive a bottom side 47 of a said second board-like member 11 upon insertion thereof in said space 20 in a direction perpendicular to the bottom portion 2 (i.e. from above as seen in Fig. 5) and to guide this member 11 along the guide surface 93, 103 towards and past a lower edge 94 thereof. The second board-like member 11 brought past said lower edge of the guide surface is then allowed to be brought straight down towards the bottom portion 2 with the lower edge of the guide surface pressing against a wide side 12 of the second board-like member. The retaining part 91, 101 is thus configured to automatically snap out to the locking position, i.e. into the recess 46 as seen in Fig. 5, once a first edge 48 of the recess has been brought past the lower edge 94 of the guide surface 93, 103. To release each retaining part 91, 101 from its locking position, the spring member 90, 100 is pushed on an upper surface 95, 105 thereof facing away from the respective second board-like member 11 (see Fig. 5) making the retaining part come out of the recess 46 so that the second board-like member may be moved out of the space 20 of the element 1.

[0032] The element 1 also has two wall members 16, 17 each extending from the bottom portion 2 perpendicularly, or at least substantially perpendicularly, to the outer 6, 7 and inner 9, 10 wall portions of a respective couple

6, 9 and 7, 10 of such wall portions to define an opening 18, 19 into the space 20 of the element defined by the wall portions and the wall member. Each such opening 18, 19 is directed along the extension of a said first board-like member 5 to be received in the space 20 with a width of this opening substantially corresponding to the thickness, i.e. the dimension of the thin side 4, of this member so as to form a support for and prevent the second board-like member 11 from leaving the space 20 in the direction of this opening along said plane. Accordingly, such second board-like members will each be held in place and bear on a wall member 16, 17 and an inner wall portion 9, 10.

[0033] Furthermore, the bottom portion 2 as well as the outer wall portions 6, 7 are provided with through-holes 21, 22 for securing these portions by screws to other components when desired, such as to a pallet or said board-like members.

[0034] Each outer wall portion 6, 7 is also provided with an aperture 23 configured to receive a strap to be led to and through a corresponding aperture in a said element 1 arranged at the opposite of the top plane and the bottom plane of the structure and to be tightened for increasing the stability of the structure. These apertures 23 are located where the outer wall portions 6, 7 are joined to the bottom portion 2 and extend into the bottom portion as clearly visible in Figs. 1-3 facilitating introduction of a strap into these apertures while running from the aperture along opposite sides of the outer wall portion in the direction perpendicularly to the bottom portion.

[0035] Each opening 18, 19 of the element 1 comprises a stop member 24, 25 extending from the bottom portion 2 in parallel with the respective said wall member 16, 17 to form a stop for an end 26 of a first board-like member 5 introduced through the opening. The two outer wall portions 6, 7 are connected to each other through the two stop members 24, 25 so that in an active state of the element, as shown in Fig. 4, an outer recess 27 with a square cross-section as seen perpendicularly to the bottom portion is formed externally of the element 1 along said edge 13 of the structure.

[0036] Finally, the bottom portion 2 is where each outer wall portion 6, 7 is joined thereto provided with a slot 28 enabling folding of a part 29, 30 of the bottom portion out from the rest of the bottom portion to extend perpendicularly thereto in a direction opposite to the extension of the outer wall portions from the bottom portion for using this part as a guide for stacking a member onto the cage-like structure or securing a lid onto the structure by using a through-hole 31 therein for applying a screw.

[0037] Fig. 4 shows how a cage-like structure may be formed by using elements 1 according to the invention in each corner 40 thereof where a bottom 41 or a top 42 plane of the structure meets two walls 14, 15 of the structure extending perpendicularly to this plane and to each other. It is seen how the elements at the lower corners of the structure may be secured onto a pallet 43 and first board-like members 5 be introduced into the elements

to bear against the outer wall portions 6, 7 and second board-like members 11 be introduced therebehind to bear against the inner wall portions 9, 10 and the wall members 16, 17. This is also done at the upper corners of the structure by for instance applying the elements 1 from above onto the second board-like members and introducing the first board-like members from below into the elements and then securing them thereto by screws. Straps may then also be used for increasing the stability of the structure when desired. It is shown how the structure may be further reinforced by applying further board-like members 44, 45 thereto.

[0038] The invention is of course not in any way restricted to the examples described above but many possibilities to modifications thereof would be apparent to a person with ordinary skill in the art without for that sake departing from the scope of the invention as defined in the appended claims.

[0039] The element may have any size, but it is preferred to provide several sizes, such as two sizes with 19 mm and 38 mm opening widths compatible with European and US lumber sizes.

[0040] It should be clarified that the flat surface of the bottom portion of the element will be directed upwardly when the element is used in a lower corner of the structure and be directed downwardly to have said board-like members thereunder when the element is used in an upper corner of the structure.

[0041] That "each inner wall portion has a general extension which is parallel to the extension of the opposite outer wall portion" means that one or more parts of each inner wall portion may extend in another direction, but each inner wall portion seen as one unit extends in parallel with the opposite outer wall portion, i.e. for instance upwardly as seen in Figs. 1 and 2. Each inner and outer wall portion may be constituted by one continuous wall section only, or by two or more wall sections spaced apart.

Claims

1. An element (1) to, in an active state, be arranged in a corner (40) of a parallelepipedic cage-like structure where a bottom (41) or a top (42) plane of the structure meets two walls (14, 15) of the structure extending perpendicularly to this plane (41, 42) and to each other,

the element (1) comprising

- a bottom portion (2) with a flat surface (3) to bear on a thin side (4) of two first board-like members (5), such as wooden planks, of the structure meeting each other at the corner (40) and each extending from the corner (40) along said plane (41, 42) to a respective adjacent corner (40) of the struc-

ture,

- two outer wall portions (6, 7) to be located externally of the structure in said active state of the element (1) and extending from the bottom portion (2) perpendicularly thereto towards the opposite said plane (41, 42) so as to each form a lateral support to a wide side (8) of a respective said first board-like member (5) received in the element (1),
- two inner wall portions (9, 10) located opposite to the outer wall portions (6, 7) and in an active state of the element (1) extending from the bottom portion (2) mainly in the same direction as the outer wall portions (6, 7) each with a distance separating the outer (6, 7) and inner (9, 10) wall portions of each couple of such wall portions (6, 7, 9, 10) so as to receive a said first board-like member (5) and a second board-like member (11) therebetween with wide sides (8, 12) of these board-like members (5, 11) bearing on each other, wherein each second board-like member (11) is a part of the structure extending along an edge (13) between two adjacent walls (14, 15) of the structure from one of said planes (41, 42) to the other, and
- two wall members (16, 17) extending from the bottom portion (2) perpendicularly to the outer (6, 7) and inner (9, 10) wall portions of each couple of such wall portions (6, 7, 9, 10) to define an opening (18, 19) into a space (20) of the element (1) defined by the wall portions (6, 7, 9, 10) and this wall member (16, 17), which opening (18, 19) is directed along the extension of a said first board-like member (5) to be received in that space (20) with a width of this opening (18, 19) substantially corresponding to the thickness, i.e. the dimension of said thin side (4), of this member (5) so as to form a support for and prevent the second board-like member (11) from leaving said space (20) in the direction of this opening (18, 19) along said plane (41, 42),

characterized in that the inner wall portions (9, 10) each comprises a spring member (90, 100) configured to, in a rest state, extend into said space (20) at least partly towards the opposite outer wall portion (6, 7) and to be urged away from this outer wall portion (6, 7) by said first and second board-like members (5, 11) when received between said couple of wall portions (6, 7, 9, 10) while storing potential energy and bear onto and urge said second board-like member (11) to press said first board-like member (5) against said outer wall portion (6, 7), and that each spring member (90, 100) has locking

means comprising a retaining part (91, 101) protruding from a main body (92, 102) of the spring member (90, 100) in a direction down towards the bottom portion (2) of the element (1), which retaining part (91, 101) is configured to, in the active state of the element (1), bear onto and urge a said second board-like member (11) in a direction at least partly down towards the bottom portion (2) so as to counteract movement of this board-like member (11) away from the bottom portion (2) and out of said space (20).

2. An element (1) according to claim 1, **characterized in that** each spring member (90, 100) has locking means configured to, in the active state of the element (1), interact with locking means on a said second board-like member (11) received in said space (20) so as to fixedly secure said board-like member (11) to the spring member (90, 100).
3. An element (1) according to claim 2, **characterized in that** the locking means of each spring member (90, 100) comprises a retaining part (91, 101) protruding from a main body (92, 102) of the spring member (90, 100) and configured to interact with locking means of a said second board-like member (11) in the form of a recess (46) on a said wide side (8) of this member (11) by being received in and engage with the recess (46) in a locking position of the retaining part (91, 101) so as to fixedly secure said board-like member (11) to the spring member (90, 100).
4. An element (1) according to claim 3, **characterized in that** each retaining part (91, 101) has a guide surface (93, 103) facing away from and pointing down towards the bottom portion (2) of the element (1), that the guide surface (93, 103) is to receive a bottom side (47) of a said second board-like member (11) upon insertion thereof in said space (20) in a direction perpendicular to the bottom portion (2) and to guide this member (11) along the guide surface (93, 103) towards and past a lower edge (94) thereof, whereafter the second board-like member (11) is allowed to be brought straight down towards the bottom portion (2) with the lower edge (94) of the guide surface (93, 103) pressing against a wide side (12) of the second board-like member (11), and that the retaining part (91, 101) is configured to snap out to the locking position once a first edge (48) of the recess (46) on the second board-like member (11) has been brought past the lower edge (94) of the guide surface (93, 103).
5. An element (1) according to claim 3 or 4, **characterized in that** the locking means of each spring member (90, 100) comprises a said retaining part (91, 101) in the form of a flap configured to interact with

a said recess (46) in the form of an elongated groove arranged at a surface of a said wide side (12) of a said second board-like member (11) and extending perpendicularly to the longitudinal extension thereof.

6. An element (1) according to any of the preceding claims, **characterized in that** each outer wall portion (6, 7) is provided with an aperture (23) to receive a strap to be led to and through a corresponding aperture in a said element (1) arranged at the opposite said plane of the structure and to be tightened for increasing the stability of said structure.
7. An element (1) according to claim 6, **characterized in that** said aperture (23) is located where the outer wall portion (6, 7) is joined to the bottom portion (2) and extends into the bottom portion (2).
8. An element (1) according to any of the preceding claims, **characterized in that** the bottom portion (2) is provided with through-holes (21) enabling securing of this portion (2) by screws to another member of the structure or a member outside the structure.
9. An element (1) according to any of the preceding claims, **characterized in that** each outer wall portion (6, 7) is provided with at least one through-hole (22) enabling securing of a said first board-like member (5) thereto by a screw.
10. An element (1) according to any of the preceding claims, **characterized in that** each said opening (18, 19) comprises a stop member (24, 25) extending from the bottom portion (2) in parallel with a respective said wall member (16, 17) to form a stop for an end (26) of a said first board-like member (5) introduced through said opening (18, 19), and that the two outer wall portions (6, 7) are connected to each other through the two stop members (24, 25) so that in a said active state of the element (1) an outer recess (27) with a square cross-section as seen perpendicularly to the bottom portion (2) is formed externally of the element (1) along said edge (13) of the structure.
11. An element according to claim 10, **characterized in that** each stop member (24, 25) has a width in the direction pointing towards the opening (18, 19) associated with the other stop member (24, 25) being identical or substantially identical to the width of said thin side (4) of a said first board-like member (5) to be received in the element (1).
12. An element (1) according to any of the preceding claims, **characterized in that** the bottom portion (2) is where each outer wall portion (6, 7) is joined thereto provided with a slot (28) enabling folding of a part (29, 30) of the bottom portion (2) out from the rest of

the bottom portion (2) to extend perpendicularly thereto in a direction opposite to the extension of the outer wall portions (6, 7) from the bottom portion (2).

- 5 13. An element (1) according to claim 12, **characterized in that** said part (29, 30) of the bottom portion (2) is provided with at least one through-hole (31) enabling securing of this part (29, 30) to a member outside the structure.
- 10 14. A cage-like structure, such as a container, **characterized in that** it is provided with an element (1) according to any of the preceding claims at each of the eight said corners (40) thereof.

Patentansprüche

1. Element (1) zur Anordnung in einem aktiven Zustand in einer Ecke (40) eines parallelepipedischen käfigartigen Aufbaus, wobei eine untere (41) oder eine obere (42) Ebene des Aufbaus auf zwei Wände (14, 15) des Aufbaus trifft, die sich senkrecht zu dieser Ebene (41, 42) und zueinander erstrecken, wobei das Element (1) umfasst:
- einen Bodenabschnitt (2) mit einer flachen Fläche (3), der auf einer dünnen Seite (4) von zwei ersten plattenartigen Elementen (5), wie z.B. Holzbrettern, des Aufbaus aufliegt, die an der Ecke (40) aufeinandertreffen und sich jeweils von der Ecke (40) entlang der Ebene (41, 42) zu einer jeweiligen benachbarten Ecke (40) des Aufbaus erstrecken,
 - zwei äußere Wandabschnitte (6, 7), die in dem aktiven Zustand des Elements (1) außerhalb des Aufbaus angeordnet sind und sich von dem Bodenabschnitt (2) senkrecht dazu in Richtung der gegenüberliegenden Ebene (41, 42) erstrecken, um jeweils eine seitliche Abstützung für eine breite Seite (8) eines jeweiligen ersten plattenartigen Elements (5) zu bilden, das in dem Element (1) aufgenommen ist,
 - zwei innere Wandabschnitte (9, 10), die den äußeren Wandabschnitten (6, 7) gegenüberliegend angeordnet sind und sich in einem aktiven Zustand des Elements (1) von dem Bodenabschnitt (2) hauptsächlich in der gleichen Richtung wie die äußeren Wandabschnitte (6, 7) jeweils mit einer Distanz erstrecken, die die äußeren (6, 7) und inneren (9, 10) Wandabschnitte jedes Paares derartiger Wandabschnitte (6, 7, 9, 10) trennt, um das erste plattenartige Element (5) und das zweite plattenartige Element (11) dazwischen aufzunehmen, wobei breite Seiten (8, 12) dieser plattenartigen Elemente (5, 11) aneinander anliegen, wobei jedes zweite plattenartige Element (11) ein Teil des Aufbaus ist,

das sich entlang eines Rands (13) zwischen zwei benachbarten Wänden (14, 15) des Aufbaus von einer der Ebenen (41, 42) zur anderen erstreckt, und

- zwei Wandelemente (16, 17), die sich von dem Bodenabschnitt (2) senkrecht zu den äußeren (6, 7) und inneren (9, 10) Wandabschnitten jedes Paares solcher Wandabschnitte (6, 7, 9, 10) erstrecken, um eine Öffnung (18, 19) in einen Raum (20) des Elements (1) zu definieren, der durch die Wandabschnitte (6, 7, 9, 10) und dieses Wandelement (16, 17) definiert ist, wobei die Öffnung (18, 19) entlang der Erstreckung des ersten plattenartigen Elements (5) gerichtet ist, das in diesem Raum (20) aufgenommen werden soll, wobei eine Breite dieser Öffnung (18, 19) im Wesentlichen der Dicke, d.h. der Abmessung der dünnen Seite (4), dieses Elements (5) entspricht, um eine Abstützung für das zweite plattenartige Element (11) zu bilden und zu verhindern, dass das zweite plattenartige Element (11) den Raum (20) in Richtung dieser Öffnung (18, 19) entlang der Ebene (41, 42) verlässt,

dadurch gekennzeichnet, dass die inneren Wandabschnitte (9, 10) jeweils ein Federelement (90, 100) umfassen, das so konfiguriert ist, dass es sich in einem Ruhezustand in den Raum (20) zumindest teilweise in Richtung des gegenüberliegenden äußeren Wandabschnitts (6, 7) erstreckt und durch das erste und das zweite plattenartige Element (5, 11) von diesem äußeren Wandabschnitt (6, 7) weggedrückt wird, wenn es zwischen dem Paar von Wandabschnitten (6, 7, 9, 10) aufgenommen wird, während es potenzielle Energie speichert und sich auf das zweite plattenartige Element (11) stützt und es drückt, um das erste plattenartige Element (5) gegen den äußeren Wandabschnitt (6, 7) zu pressen, und dass jedes Federelement (90, 100) ein Verriegelungsmittel aufweist, das ein Halteteil (91, 101) umfasst, das von einem Hauptkörper (92, 102) des Federelements (90, 100) in einer Richtung nach unten zum Bodenabschnitt (2) des Elements (1) hin vorsteht, wobei das Halteteil (91, 101) so konfiguriert ist, dass es im aktiven Zustand des Elements (1) auf dem zweiten plattenartigen Element (11) aufliegt und das zweite plattenartige Element (11) in einer Richtung zumindest teilweise nach unten zum Bodenabschnitt (2) hin drückt, um einer Bewegung dieses plattenartigen Elements (11) weg vom Bodenabschnitt (2) und aus dem Raum (20) heraus entgegenzuwirken.

2. Element (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** jedes Federelement (90, 100) ein Verriegelungsmittel aufweist, das so konfiguriert ist, dass es im aktiven Zustand des Elements (1) mit einem Verriegelungsmittel an dem zweiten platten-

artigen Element (11) zusammenwirkt, das in dem Raum (20) aufgenommen ist, um das plattenartige Element (11) fest an dem Federelement (90, 100) zu befestigen.

3. Element (1) nach Anspruch 2, **dadurch gekennzeichnet, dass** das Verriegelungsmittel jedes Federelements (90, 100) ein Halteteil (91, 101) umfasst, das von einem Hauptkörper (92, 102) des Federelements (90, 100) vorsteht und so konfiguriert ist, dass es mit dem Verriegelungsmittel des zweiten plattenartigen Elements (11) in Form einer Ausnehmung (46) an einer breiten Seite (8) dieses Elements (11) zusammenwirkt, indem es in einer Verriegelungsposition des Halteteils (91, 101) in der Ausnehmung (46) aufgenommen wird und mit dieser in Eingriff kommt, um das plattenartige Element (11) fest an dem Federelement (90, 100) zu sichern.
4. Element (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** jedes Halteteil (91, 101) eine Führungsfläche (93, 103) aufweist, die vom Bodenabschnitt (2) des Elements (1) weg weist und nach unten zeigt, dass die Führungsfläche (93, 103) dazu dient, eine Bodenseite (47) des zweiten plattenartigen Elements (11) beim Einführen desselben in den Raum (20) in einer Richtung senkrecht zum Bodenabschnitt (2) aufzunehmen und dieses Element (11) entlang der Führungsfläche (93, 103) zu einem unteren Rand (94) desselben hin und an diesem vorbei zu führen, wobei danach das zweite plattenartige Element (11) gerade nach unten in Richtung des Bodenabschnitts (2) gebracht werden kann, wobei der untere Rand (94) der Führungsfläche (93, 103) gegen eine breite Seite (12) des zweiten plattenartigen Elements (11) presst, und dass das Halteteil (91, 101) so konfiguriert ist, dass es in die Verriegelungsposition schnappt, sobald ein erster Rand (48) der Ausnehmung (46) auf dem zweiten plattenartigen Element (11) an dem unteren Rand (94) der Führungsfläche (93, 103) vorbeigebracht worden ist.
5. Element (1) nach einem der Ansprüche 3 oder 4, **dadurch gekennzeichnet, dass** das Verriegelungsmittel jedes Federelements (90, 100) ein Halteteil (91, 101) in Form einer Klappe umfasst, die so konfiguriert ist, dass sie mit einer Ausnehmung (46) in Form einer länglichen Nut zusammenwirkt, die an einer Fläche der breiten Seite (12) des zweiten plattenartigen Elements (11) angeordnet ist und sich senkrecht zu dessen Längserstreckung erstreckt.
6. Element (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** jeder äußere Wandabschnitt (6, 7) mit einer Öffnung (23) versehen ist, um einen Riemen aufzunehmen, der zu und durch eine entsprechende Öffnung in einem Element (1), das auf der gegenüberliegenden Ebene

des Aufbaus angeordnet ist, geführt und gespannt ist, um die Stabilität des Aufbaus zu erhöhen.

7. Element (1) nach Anspruch 6, **dadurch gekennzeichnet, dass** die Öffnung (23) dort angeordnet ist, wo der äußere Wandabschnitt (6, 7) mit dem Bodenabschnitt (2) verbunden ist, und sich in den Bodenabschnitt (2) hinein erstreckt. 5
8. Element (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Bodenabschnitt (2) mit Durchgangslöchern (21) versehen ist, die eine Befestigung dieses Abschnitts (2) durch Schrauben an einem anderen Element des Aufbaus oder einem Element außerhalb des Aufbaus ermöglichen. 10
9. Element (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** jeder äußere Wandabschnitt (6, 7) mit mindestens einem Durchgangsloch (22) versehen ist, das eine Befestigung des ersten plattenartigen Elements (5) daran mittels einer Schraube ermöglicht. 15
10. Element (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** jede Öffnung (18, 19) ein Anschlagelement (24, 25) umfasst, das sich von dem Bodenabschnitt (2) parallel zu einem jeweiligen Wandelement (16, 17) erstreckt, um einen Anschlag für ein Ende (26) des ersten plattenartigen Elements (5) zu bilden, das durch die Öffnung (18, 19) eingeführt wird, und dass die beiden äußeren Wandabschnitte (6, 7) durch die beiden Anschlagelemente (24, 25) so miteinander verbunden sind, dass in dem aktiven Zustand des Elements (1) eine äußere Ausnehmung (27) mit einem quadratischen Querschnitt, senkrecht zu dem Bodenabschnitt (2) gesehen, außerhalb des Elements (1) entlang des Randes (13) des Aufbaus gebildet wird. 20 25 30 35 40
11. Element nach Anspruch 10, **dadurch gekennzeichnet, dass** jedes Anschlagelement (24, 25) eine Breite in der Richtung aufweist, die in Richtung der Öffnung (18, 19) zeigt, die dem anderen Anschlagelement (24, 25) zugeordnet ist, die identisch oder im Wesentlichen identisch mit der Breite der dünnen Seite (4) des ersten plattenartigen Elements (5) ist, das in dem Element (1) aufgenommen wird. 45
12. Element (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Bodenabschnitt (2) dort, wo jeder äußere Wandabschnitt (6, 7) daran verbunden ist, mit einem Schlitz (28) versehen ist, der es ermöglicht, einen Teil (29, 30) des Bodenabschnitts (2) aus dem Rest des Bodenabschnitts (2) herauszufalten, um sich senkrecht dazu in einer Richtung zu erstrecken, die der Erstreckung der äußeren Wandabschnitte (6, 7) 50 55

aus dem Bodenabschnitt (2) entgegengesetzt ist.

13. Element (1) nach Anspruch 12, **dadurch gekennzeichnet, dass** der Teil (29, 30) des Bodenabschnitts (2) mit mindestens einem Durchgangsloch (31) versehen ist, das eine Befestigung dieses Teils (29, 30) an einem Element außerhalb des Aufbaus ermöglicht.
14. Käfigartiger Aufbau, wie ein Behälter, **dadurch gekennzeichnet, dass** er an jeder seiner acht Ecken (40) mit einem Element (1) nach einem der vorhergehenden Ansprüche versehen ist.

Revendications

1. Élément (1) destiné, dans un état actif, à être agencé dans un coin (40) d'une structure de type cage parallélépipédique où un plan inférieur (41) ou supérieur (42) de la structure rencontre deux parois (14, 15) de la structure s'étendant perpendiculairement à ce plan (41, 42) et l'une par rapport à l'autre, l'élément (1) comprenant
- une portion inférieure (2) avec une surface plate (3) pour venir en appui sur un côté mince (4) de deux premiers organes en forme de plaque (5), tels que des plaques en bois, de la structure se rejoignant au niveau du coin (40) et s'étendant chacun depuis le coin (40) le long dudit plan (41, 42) jusqu'à un coin adjacent respectif (40) de la structure,
 - deux portions de paroi extérieures (6, 7) devant être situées à l'extérieur de la structure dans ledit état actif de l'élément (1) et s'étendant depuis la portion inférieure (2) perpendiculairement à celle-ci vers ledit plan opposé (41, 42) de manière à former chacune un support latéral vers un côté large (8) d'un premier organe en forme de plaque (5) respectif reçu dans l'élément (1),
 - deux portions de paroi intérieures (9, 10) située à l'opposé des portions de paroi extérieures (6, 7) et dans un état actif de l'élément (1) s'étendant depuis la portion inférieure (2) principalement dans la même direction que les portions de paroi extérieures (6, 7) ayant chacune une distance séparant les portions de paroi extérieure (6, 7) et intérieure (9, 10) de chaque couple de telles portions de paroi (6, 7, 9, 10) de manière à recevoir un dit premier organe en forme de plaque (5) et un deuxième organe en forme de plaque (11) entre ceux-ci avec des côtés larges (8, 12) de ces organes en forme de

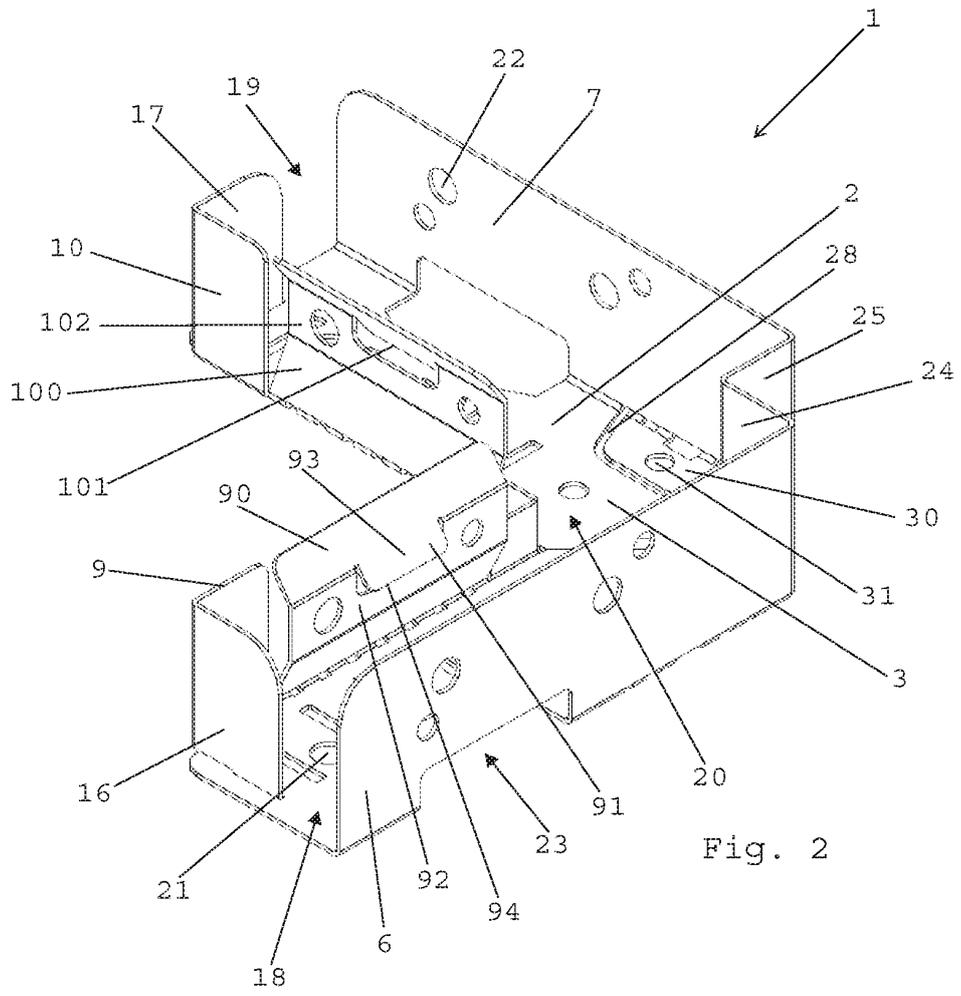
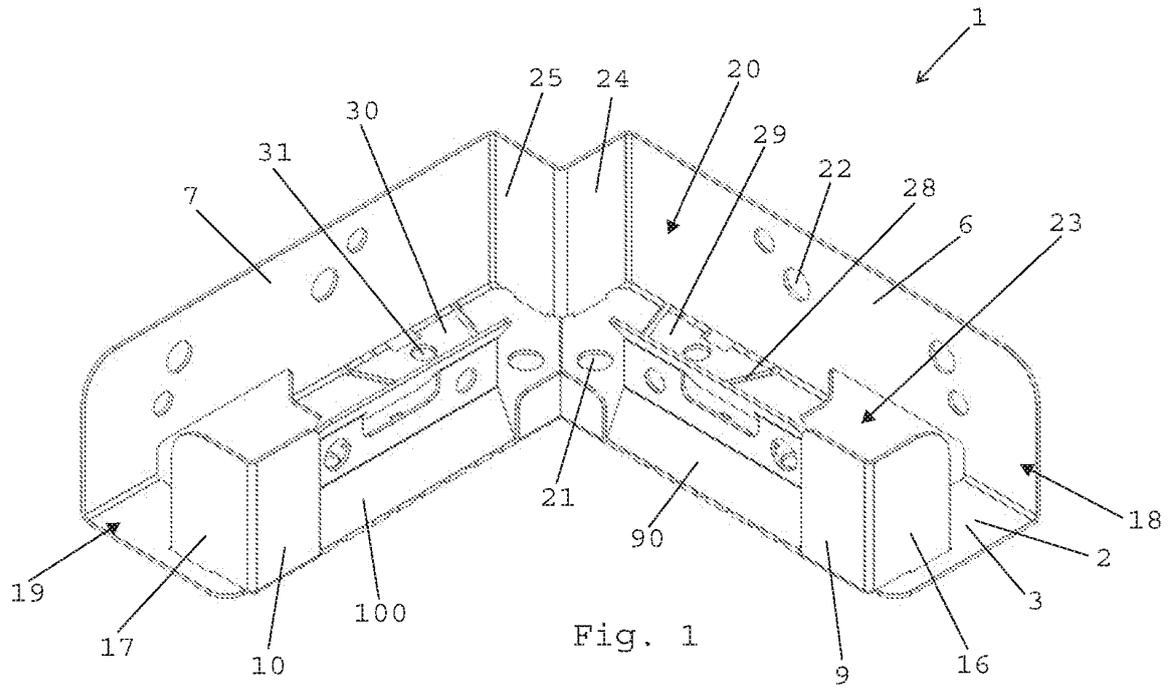
plaque (5, 11) en appui l'un sur l'autre, dans lequel chaque deuxième organe en forme de plaque (11) constitue une partie de la structure s'étendant le long d'un bord (13) entre deux parois adjacentes (14, 15) de la structure à partir d'un desdits plans (41, 42) jusqu'à l'autre, et

- deux organes de paroi (16, 17) s'étendant depuis la portion inférieure (2) perpendiculairement aux portions de paroi extérieures (6, 7) et intérieures (9, 10) de chaque couple de telles portions de paroi (6, 7, 9, 10) pour définir une ouverture (18, 19) dans un espace (20) de l'élément (1) défini par les portions de paroi (6, 7, 9, 10) et cet organe de paroi (16, 17), laquelle ouverture (18, 19) est dirigé le long de l'extension d'un dit premier organe en forme de plaque (5) destiné à être reçu dans cet espace (20) avec une largeur de cette ouverture (18, 19) correspondant sensiblement à l'épaisseur, c'est-à-dire la dimension dudit côté mince (4), de cet organe (5) de manière à former un support pour le deuxième organe en forme de plaque (11) et empêcher celui-ci de quitter ledit espace (20) dans la direction de cette ouverture (18, 19) le long dudit plan (41, 42),

caractérisé en ce que les portions de paroi intérieures (9, 10) comprennent chacune un organe de ressort (90, 100) configuré pour, dans un état de repos, s'étendre dans ledit espace (20) au moins partiellement vers la portion de paroi extérieure (6, 7) opposée et pour être poussées en éloignement de cette portion de paroi extérieure (6, 7) par lesdits premier et deuxième organes en forme de plaque (5, 11) lorsqu'ils sont reçus entre ledit couple de portions de paroi (6, 7, 9, 10) tout en emmagasinant de l'énergie potentielle et venant en appui sur et en poussant ledit deuxième organe en forme de plaque (11) pour presser ledit premier organe en forme de plaque (5) contre ladite portion de paroi extérieure (6, 7), et **en ce que** chaque organe de ressort (90, 100) a un moyen de verrouillage comprenant une partie de retenue (91, 101) faisant saillie depuis un corps principal (92, 102) de l'organe de ressort (90, 100) dans une direction descendante vers la portion inférieure (2) de l'élément (1), laquelle partie de retenue (91, 101) est configuré pour, dans l'état actif de l'élément (1), venir en appui sur et pousser un dit deuxième organe en forme de plaque (11) dans une direction au moins partiellement descendante vers la portion inférieure (2) de manière à contrer le mouvement de cet organe en forme de plaque (11) en éloignement de la portion inférieure (2) et hors dudit espace (20).

2. Élément (1) selon la revendication 1, **caractérisé en ce que** chaque organe de ressort (90, 100) a un moyen de verrouillage configuré pour, dans l'état actif de l'élément (1), interagir avec un moyen de verrouillage sur un dit deuxième organe en forme de plaque (11) reçu dans ledit espace (20) de manière à fixer de manière fixe ledit organe en forme de plaque (11) à l'organe de ressort (90, 100).
3. Élément (1) selon la revendication 2, **caractérisé en ce que** le moyen de verrouillage de chaque organe de ressort (90, 100) comprend une partie de retenue (91, 101) faisant saillie depuis un corps principal (92, 102) de l'organe de ressort (90, 100) et configuré pour interagir avec un moyen de verrouillage d'un dit deuxième organe en forme de plaque (11) sous la forme d'un évidement (46) sur un dit côté large (8) de cet organe (11) en étant reçu dans et en prise avec l'évidement (46) dans une position de verrouillage de la partie de retenue (91, 101) de manière à fixer de manière fixe ledit organe en forme de plaque (11) à l'organe de ressort (90, 100).
4. Élément (1) selon la revendication 3, **caractérisé en ce que** chaque partie de retenue (91, 101) a une surface de guidage (93, 103) faisant face à l'opposé de la portion inférieure (2) de l'élément (1) et orienté vers le bas, **en ce que** la surface de guidage (93, 103) est destinée à recevoir un côté inférieur (47) d'un dit deuxième organe en forme de plaque (11) lors de son insertion dans ledit espace (20) dans une direction perpendiculaire à la portion inférieure (2) et à guider cet organe (11) le long de la surface de guidage (93, 103) vers et au-delà d'un bord bas (94) de celui-ci, après quoi le deuxième élément en forme de plaque (11) peut être amené directement vers le bas vers la portion inférieure (2) avec le bord inférieur (94) de la surface de guidage (93, 103) en pressant contre un côté large (12) du deuxième organe en forme de plaque (11), et **en ce que** la partie de retenue (91, 101) est configurée pour se dégager en position de verrouillage une fois qu'un premier bord (48) de l'évidement (46) sur le deuxième organe en forme de plaque (11) a été amené au-delà du bord bas (94) de la surface de guidage (93, 103).
5. Élément (1) selon la revendication 3 ou 4, **caractérisé en ce que** le moyen de verrouillage de chaque organe de ressort (90, 100) comprend une dite partie de retenue (91, 101) sous la forme d'un volet configuré pour interagir avec un dit évidement (46) sous la forme d'une rainure allongée agencée au niveau d'une surface d'un dit côté large (12) d'un dit deuxième organe en forme de plaque (11) et s'étendant perpendiculairement à son extension longitudinale.
6. Élément (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** chaque

- portion de paroi extérieure (6, 7) est pourvue d'un orifice (23) pour recevoir une sangle à conduire vers et à travers un orifice correspondant dans un dit élément (1) agencé au niveau dudit plan opposé de la structure et à serrer pour augmenter la stabilité de ladite structure.
7. Élément (1) selon la revendication 6, **caractérisé en ce que** ledit orifice (23) est situé à l'endroit où la portion de paroi extérieure (6, 7) est reliée à la portion inférieure (2) et s'étend dans la portion inférieure (2).
8. Élément (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la portion inférieure (2) est pourvue de trous traversants (21) permettant la fixation de cette portion (2) par des vis à un autre organe de la structure ou à un organe extérieur à la structure.
9. Élément (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** chaque portion de paroi extérieure (6, 7) est pourvue d'au moins un trou traversant (22) permettant la fixation d'un dit premier organe en forme de plaque (5) à celui-ci par une vis.
10. Élément (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** chacune desdites ouvertures (18, 19) comprend un organe de butée (24, 25) s'étendant depuis la portion inférieure (2) parallèlement audit organe de paroi (16, 17) respectif pour former une butée pour une extrémité (26) d'un dit premier organe en forme de plaque (5) introduit à travers ladite ouverture (18, 19), et **en ce que** les deux portions de paroi extérieures (6, 7) sont raccordées l'une à l'autre par l'intermédiaire des deux organes de butée (24, 25) de sorte que, dans un dit état actif de l'élément (1), un évidement extérieur (27) de section transversale carrée, vu perpendiculairement à la portion inférieure (2), est formé à l'extérieur de l'élément (1) le long dudit bord (13) de la structure.
11. Élément selon la revendication 10, **caractérisé en ce que** chaque organe de butée (24, 25) a une largeur dans la direction orientée vers l'ouverture (18, 19) associée à l'autre organe de butée (24, 25) qui est identique ou sensiblement identique à la largeur dudit côté mince (4) d'un dit premier organe en forme de plaque (5) destiné à être reçu dans l'élément (1).
12. Élément (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la portion inférieure (2) est à l'endroit où chaque portion de paroi extérieure (6, 7) est reliée à celle-ci pourvue d'une fente (28) permettant le pliage d'une partie (29, 30) de la portion inférieure (2) hors du reste de la portion inférieure (2) pour s'étendre perpendiculairement à celle-ci dans une direction opposée à l'extension des portions de paroi extérieures (6, 7) à partir de la portion inférieure (2).
- 5 13. Élément (1) selon la revendication 12, **caractérisé en ce que** ladite partie (29, 30) de la portion inférieure (2) est pourvue d'au moins un trou traversant (31) permettant la fixation de cette partie (29, 30) à un organe extérieur à la structure.
- 10 14. Structure en forme de cage, telle qu'un conteneur, **caractérisée en ce qu'**elle est pourvue d'un élément (1) selon l'une quelconque des revendications précédentes au niveau de chacun desdits huit coins (40) de celle-ci.
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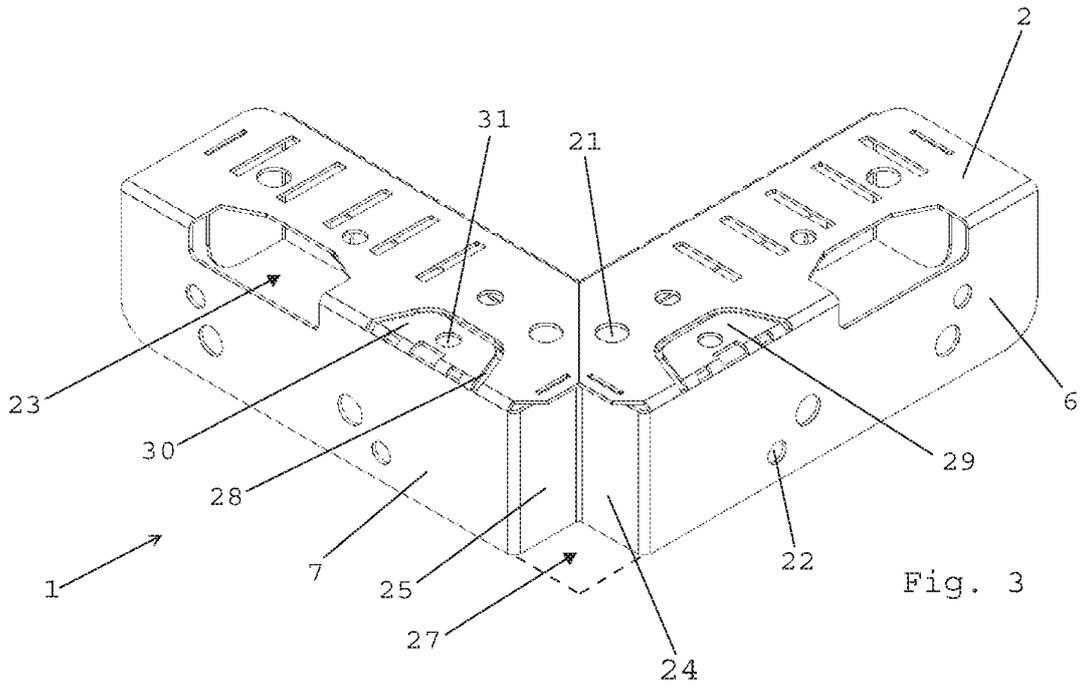


Fig. 3

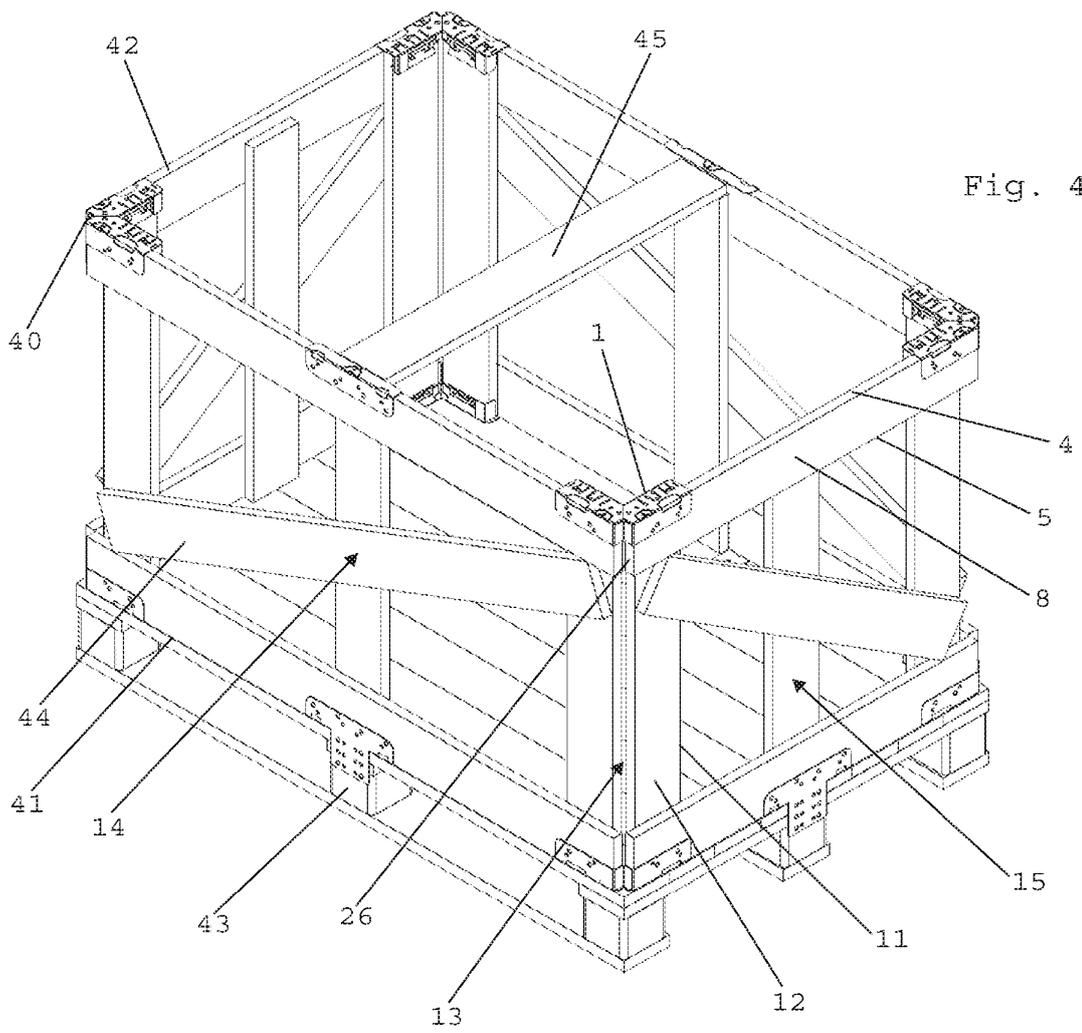


Fig. 4

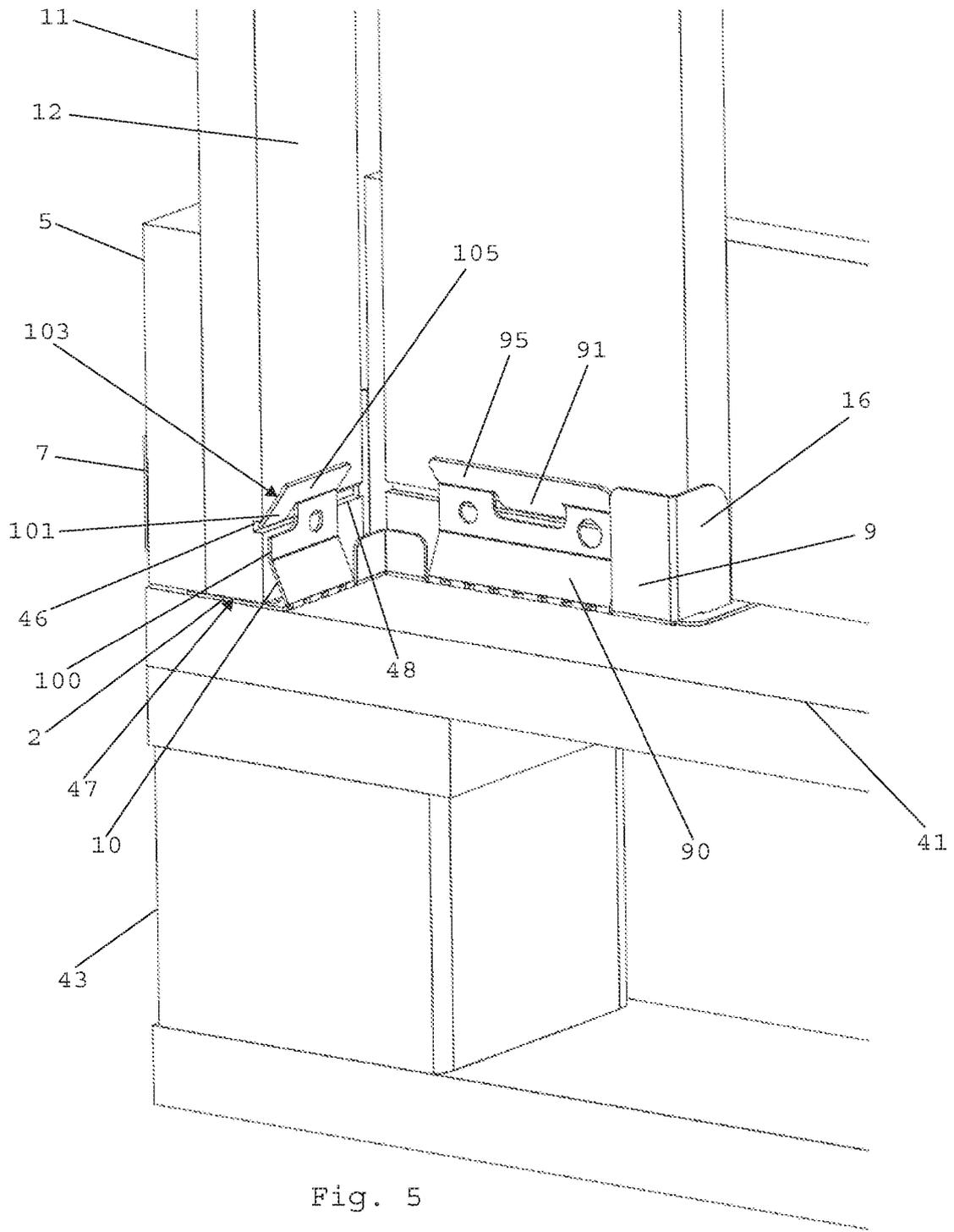


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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